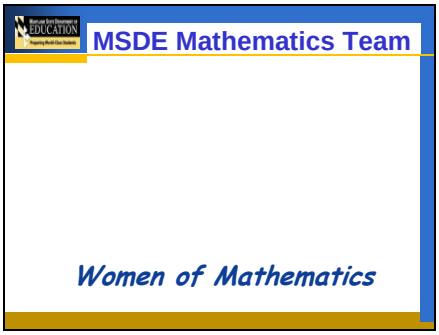
Slide 1

Welcome to the Mathematics Webinar designed as a follow-up from this summer's Educator Effectiveness Academy.

First, let me begin by thanking you for being a Mathematics leader at your school. Your participation in the academy this past summer and today's Webinar are very important as we look forward to reforming Maryland.

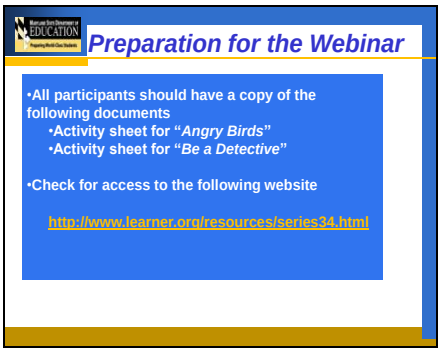
Slide 2



I would like to take a minute to introduce the specialists who have worked on this project, as well as all our other projects in Mathematics for Race To The Top, for instruction and for assessments.

Bette Kundert is the elementary Mathematics specialist concentrating on PreK-4. Marci Frye works at middle school. She's a middle school specialist focusing on grades 5 and 6. Karen Ross is also a middle school specialist and she leads our grades 7 and 8 work. High School is lead by Linda Kaniecki. She is our high school specialist. Additionally to our Race To The Top funds we have also hired Sara Reed who works side-by-side with Marci and Karen at middle school. Debbie Ward who is partners with Linda for the High School project. I'm Donna Watts. I have the privilege of being the Coordinator of Mathematics. My job focuses on policy and outreach for the department. Most importantly my job is to assist and provide guidance to the specialist working in Mathematics.

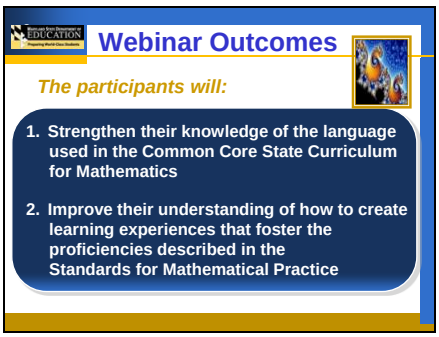
Slide 3



This Webinar is intended to produce additional professional development on the Common Core State Standards for Mathematics. In an attempt to make this a more user friendly experience, we have developed several interactive activities. These activities make use of several websites and word documents.

Before proceeding, please make sure you have copies of the activity sheets for the "*Angry Birds*" and "*Be a Detective*". If you haven't confirmed that you have access or you don't have these documents, please pause now and restart when you're ready.

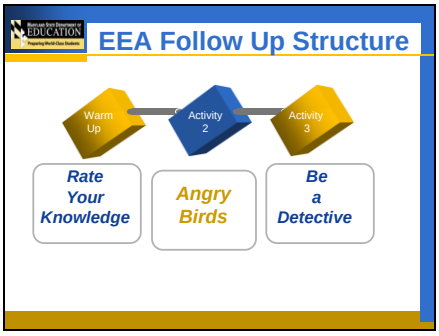
Slide 4



This slide lists the outcomes for the activities in this Webinar. The rationale for why we selected the stated outcomes is based on an important point made by David Sousa in his book "How the Brain Learns Mathematics." Sousa discusses the fact that repeated practice, distributed over time is the key to retention.

Our hope is that the activities provided in this Webinar will help educators retain… and even extend… what they already know about the Common Core State Standards.

Slide 5



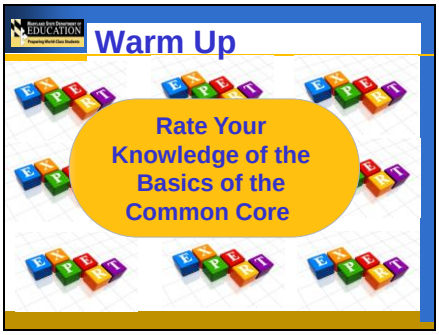
The Mathematics Webinar is divided into 3 distinct parts – a warm up activity and two other activities. In order to accommodate your busy professional schedules, we have created this Webinar in such a way that it can be viewed in one long session or in 2 to 3 shorter sessions. We hope this flexibility allows you to participate in and benefit from each session as fully as possible.

The warm up activity is a fun trivia game aimed at reviewing the structure and language of the Common Core State Standards.

Activity 2 is based on the wildly popular video *Angry Birds*. Now, I'll bet you are already wondering how a video game could possibly connect to Common Core!!! Especially to the Standards for Mathematical Practice!!! You'll simply have to be patient and stay tuned!!!

Activity 3, *Be a Detective*, is in response to the often-expressed request from Mathematics educators around our State to be provided with visual examples of student behaviors that indicate both teacher and student engagement in the Standards for Mathematical Practice.

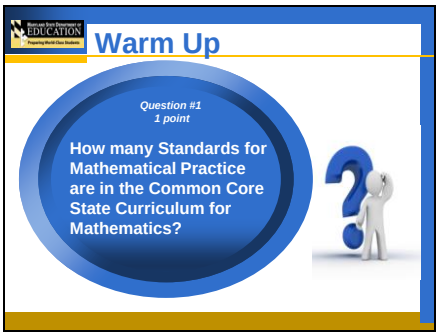
Slide 6



Ok, everyone it's time to put your thinking caps on. Before starting, everyone should get a piece of paper or a white board where you can record your answers to 9 questions that are going to show on the next 9 slides. For added entertainment you might want to challenge yourself by competing with colleagues who are with you now to see who can accumulate the most points!

Each question is appropriately timed for you to respond. The answers will be shared after a few seconds so you can check your work. Then the Webinar will automatically go to the next question. The questions vary in difficulty and therefore are worth various point values. Award yourself points as appropriate for each question you answer correctly.

Slide 7

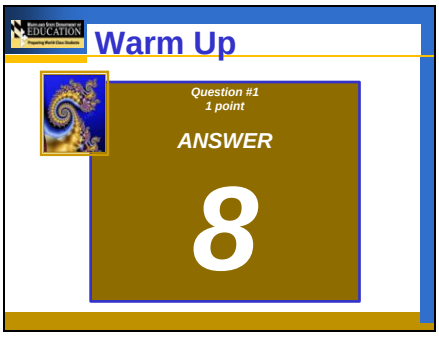


Ok, let's get started and see how you stack up! Question #1, fairly easy one worth 1 point.

How many Standards for Mathematical Practice are in the Common Core State Curriculum for Mathematics?

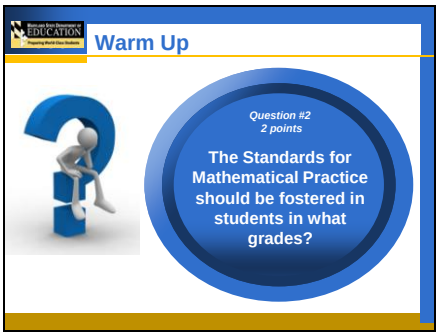
Show it to your partners and see how you all stack up!

Slide 8



Ok, the answer to this one is 8. Hopefully everybody got that one right and can award themselves 1 point.

Slide 9

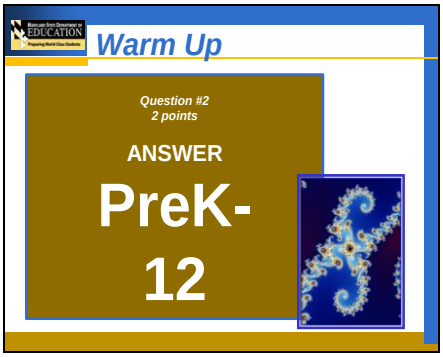


Question #2 is worth 2 points.

The Standards for Mathematical Practice should be fostered in students in what grades?

Ok, take a minute and record your answers on your white board. Share your answers with the people in the room with you.

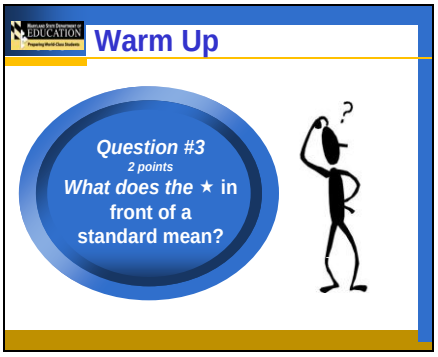
Slide 10



Ok, let's see how you all did And the answer to question 2 is that we want to develop these efficiencies in the practice in Pre K -12.

Give yourself 2 points for that one.

Slide 11



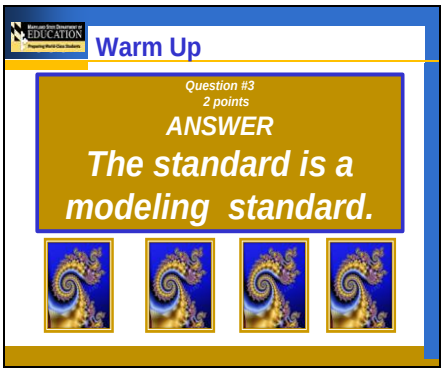
Moving on to question#3. Question 3 is worth 2 points.

You may have noticed a star in front of some of the standards in some of the documents.

What does the "*" in front of a standard mean?

Ok, is everybody jotting down that answer on that white board? Ok, share your answers with your partners.

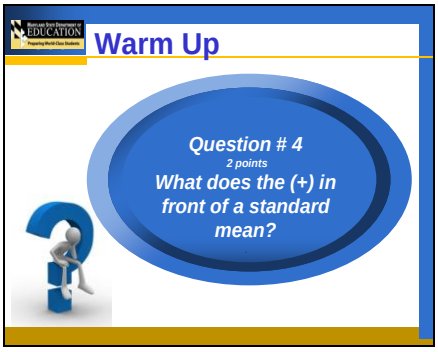
Slide 12



Ok, let's see if you got it. The answer to question 3 when you see that star in front of the standard means that it's a modeling standard.

Again, give yourself 2 points if you answered that one correctly.

Slide 13



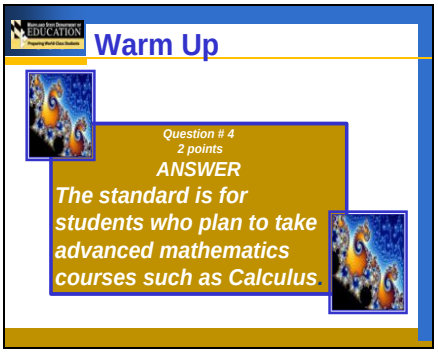
Question #4, again a 2 point question.

Once again, it has to do with the symbolism you're going to find in these documents.

What does the (+) in front of a standard mean?

What does that represent? A plus sign in front of the standard. Jot down your answer. Share with your partners.

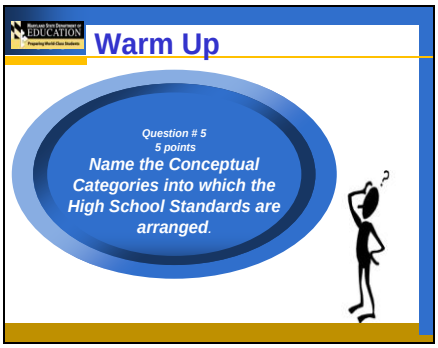
Slide 14



And the answer to this one is that this is for the students who plan to go on to advanced Mathematics courses such as Calculus!

This might be for your honors type student. People in honors Algebra 1, honors Geometry or honors Algebra 2.

Slide 15



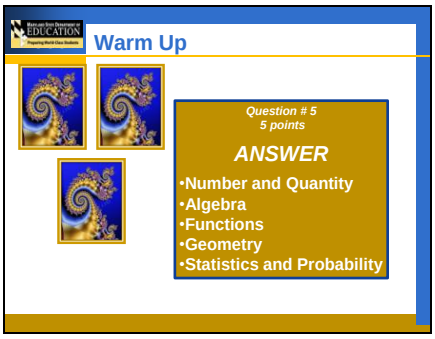
Ok, question #5, a little different this one is worth 5 points.

This is not so much a question but more of a task to do.

Name the Conceptual Categories into which the High School Standards are arranged.

We will allow a little bit more wait time on this one.

Slide 16



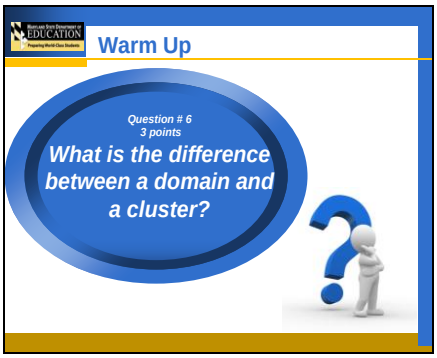
Ok, let's see if you got it.

There are 5 conceptual categories and give yourself 1 point for each one.

1. Number and Quantity
2. Algebra
3. Functions
4. Geometry
5. Statistics and Probability

So you can get partial credit on that one.

Slide 17



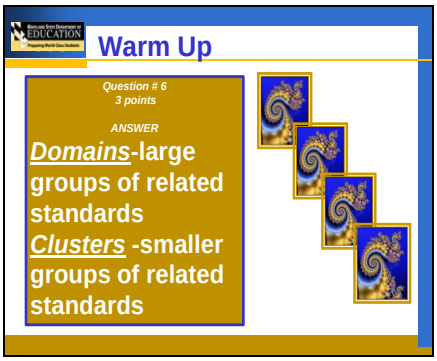
Ok question #6 , a 3 pointer.

What is the difference between a domain and a cluster?

Alright record your answer.

This will take a little more writing so we'll wait another few seconds.

Slide 18

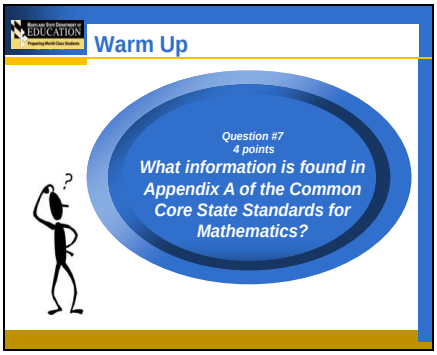


Ok, let's go to the answer.

Domains are large groups of related standards and Clusters, there are underneath those they are smaller groups of related standards

Give yourself 3 points for that one if you go it correct.

Slide 19

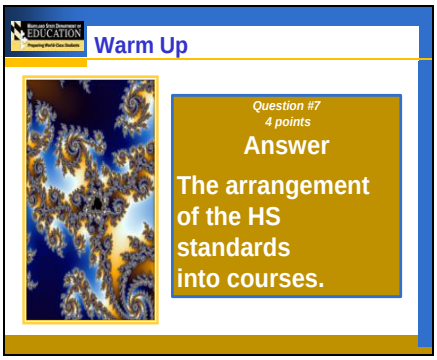


Moving on to question #7, which is a 4 point question.

What information is found in Appendix A of the Common Core State Standards for Mathematics?

Appendix A, what are you going to look there for? Ok, record that answer.

Slide 20

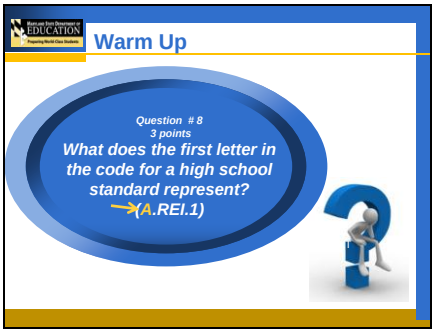


Let's see how you did. This is a 4 pointer because we thought this might be a little more challenging.

The answer to question #7 worth 4 points is that in Appendix A you'll find the arrangement of the High School standards into courses!

Maryland is following the traditional pathway of Algebra 1, Geometry, Algebra 2. Some states are going with more of an integrative approach and it's also found in this Appendix A.

Slide 21



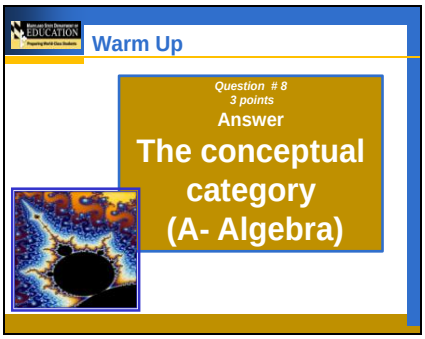
Question #8, worth 3 points.

What does the first letter in the code for High School Standard represent?

As you can see on the slide with the arrow pointing to the A. What does that A represent?

Ok, put your answer down on your whiteboard. Share with your partners.

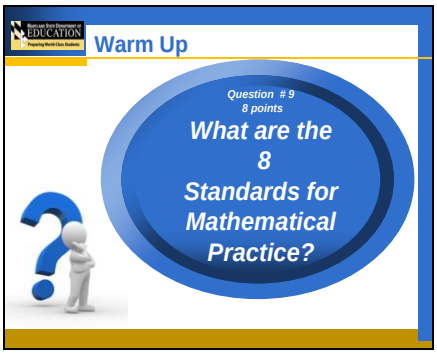
Slide 22



Let's see how you did. Award yourself 3 points if the answer to the question is given as the conceptual category (A-Algebra).

And you don't have to have this but in this particular case the A represented Algebra.

Slide 23

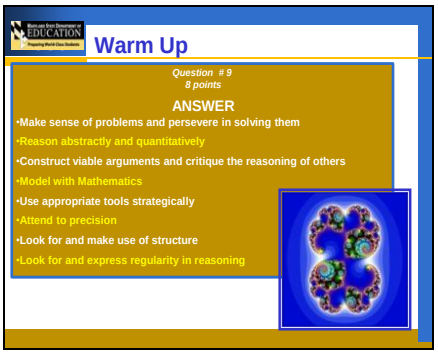


Ok, final question #9. This is an 8 pointer because there are basically 8 pieces to it.

What are the 8 Standards for Mathematical Practice?

And we will allow about 1 minute or so wait time to see how many of them you can list in that amount of time.

Slide 24

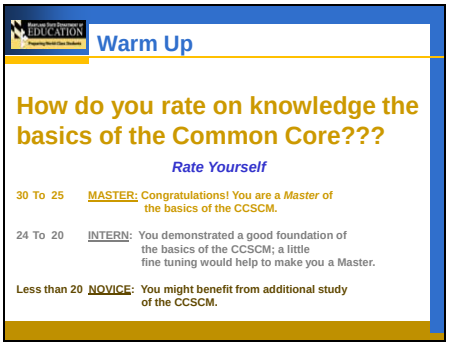


Ok, let's see how many you got in that amount of time. Let's look at the answers. These are just the bolded headings of course we know that they are full paragraphed descriptions of these. Give yourself 1 point for each one. In case this is hard to read they are:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with Mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Ok now give yourself 1 point for each one.

Slide 25



Now total up your points. There is a possible total points of 30. Let's see how you did. I'm going to give you a minute to add those up. Ok and here are the ratings. Are you a Master? Do you really know the basics for the Common Core? Are you an Intern or a Novice?

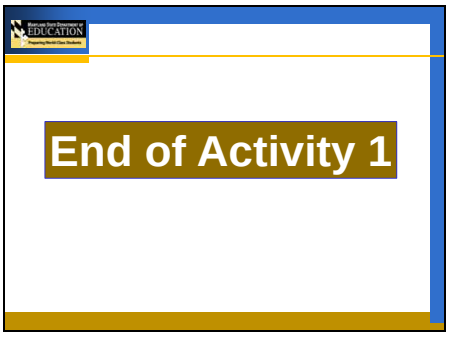
Hopefully everyone is an expert! But if not we know that with a little more study and all the material out there on the Common Core that every Maryland educator will become a Master of the Common Core State Curriculum for Mathematics.

30-25 Master! Congratulations! YOU are a Master of the basics of CCSCM.

24-20 Intern! YOU demonstrated a good foundation of the basics of CCSCM; a little fine tuning would help make you a MASTER.

<20 Novice! You are off to a good start and might benefit from additional study of the CCSCM.

Slide 26



This is the end of the first activity. If you are planning to watch this in 3 sessions, this is a good place to stop the Webinar.

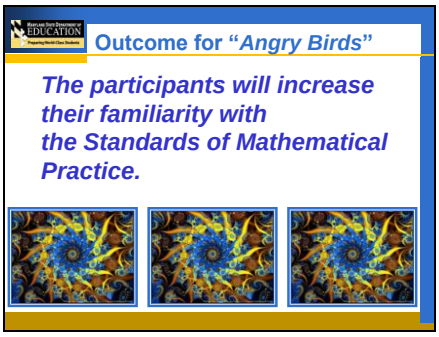
Otherwise, let's keep going!

Slide 27

Welcome to the second activity.

This activity is designed to help you continue your growth in understanding of the Standards for Mathematical Practice. You will have an opportunity to connect between these Standards and comments expressed on Dan Meyer's blog entitled "Five Lessons on Teaching from Angry Birds that Have Nothing Whatsoever to do with Parabolas." Even though this activity has nothing to do with parabolas it does have a lot to do with the Standards for Mathematical Practice!

Slide 28



Many of the activities from this past summer's Educator Effectiveness Academies targeted the Standards for Mathematical Practice.

Local school systems have been encouraged to begin implementing these Standards during the current school year.

Because this is a new initiative, Maryland educators may be at varying stages of developing a deep understanding of the Practices. Readiness with the Practices, influence the types and quality of learning experience that educators should incorporate into daily lessons.

This activity was designed as a reflective activity. To make it more engaging, we are going to use

the video game *Angry Birds* as a starting point.

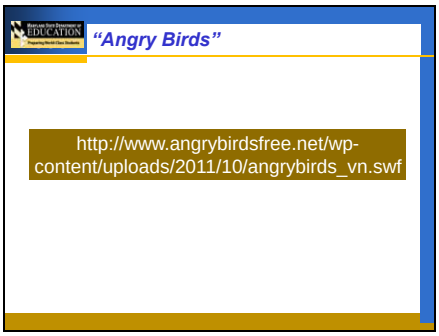
Slide 29

One of the final activities for Mathematics teachers at the Academy last summer was to watch and reflect on a video of nationally renowned Mathematics teacher, Dan Meyer, delivering a speech entitled "The Math Classroom Needs a Makeover."

Today, we are going to call on Dan once again. He has graciously allowed us to share his thoughts on the importance of the game Angry Birds to enhance student proficiencies in the Standards for Mathematical Practice.

Through a post on his Blog, Dan uses *Angry Birds* to encourage a discussion among educators that focuses on what they can learn about teaching by analyzing the design of this video game.

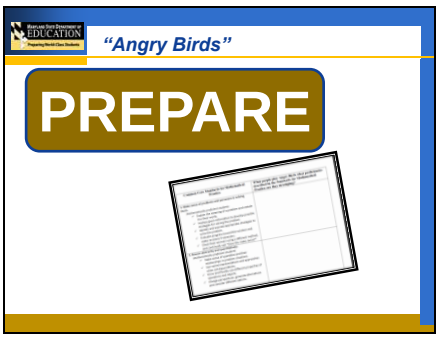
Slide 30



If you are not familiar with Angry Birds, you might want to *PAUSE* the Webinar and take a few minutes to visit the Angry Birds site and get to know the game.

http://www.angrybirdsfree.net/wpcontent/uploads/2011/10/angrybirds_vn.swf

Slide 31



Also be sure you have a copy of the *Angry Birds Reflection* document before you begin this activity.

Slide 32

In these next few slides we suggest what a teacher might do with an activity in order to make Mathematics accessible to students. After that you will be asked to determine how an activity like *Angry Birds* creates an environment that enables students to engage the Standards for Mathematical Practice.

Mr. Meyer has shared a number of observations about *Angry Birds* which are applicable to the tasks you assign your students, though the applications will vary from class to class and concept to concept.

Notice, there's a huge button "Play." By contrast, how often do your students look at their assignments and say, "I don't know what I'm supposed to be doing".

Thus the first observation here highlights the importance of making a task easy to start.

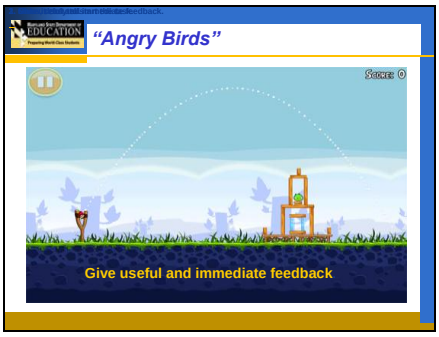
Slide 33

Angry Birds was designed in Finland. The game is sold around the world. That creates an enormous design challenge.

Imagine you had to make Mathematics clear to students who don't speak any English. How many students would be successful in your class?

Therefore, when we work with students we need to remember to **show**, not just **tell** how.

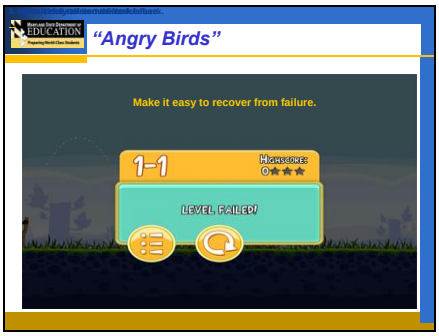
Slide 34



The importance of feedback, not parabolic motion, is what we should learn from the trails the birds leave behind. When you miss, you can easily re-adjust. The trails help you quickly learn the power of the slingshot and the mass of the birds.

What kind of feedback do we offer students while they're learning Mathematics? Is it useful and immediate, or vague and delayed?

Slide 35



Finally, after your birds get defeated, you only have to experience failure as long as it takes you to press the huge undo arrow. Once you're successful, that's ALL the game remembers. Your losses aren't stored anywhere. They are not weighted against your successes when the game tallies your final score.

Slide 36

Message #5 Is a little bit different.

You're always flinging birds at pigs. As you master one kind of bird, though, you get new ones with different capabilities. The levels get harder. You can get away with a lot of imprecision in early levels but later on you have to be accurate down to a few pixels. This all happens gradually, with enough overlap that you head into each new task with a sense of confidence and determination.

As educators do we properly scaffold learned experiences to allow student to develop a strong foundation upon which to build future learning?

Slide 37

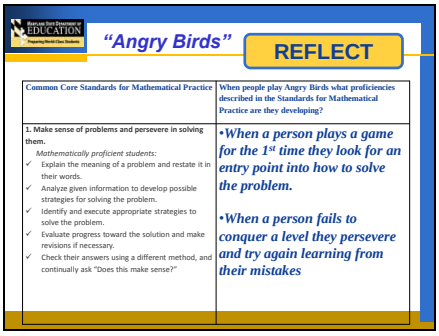
Now it's time for you to do some work.

While Dan Meyer's message gives us something to think about when we reflect on our teaching practices, we want to look at *Angry Birds* and other video games in another way.

Reflect on behaviors displayed by a person when playing a video game over and over again in an attempt to conquer each level.

For Activity 2, we would like you to use the Angry Birds reflection sheet to record your thoughts about how the behaviors displayed by a person attempting to beat a video game connect to the proficiencies described in the Standards of Mathematical Practice.

Slide 38



A sample response is shown in column 2 of the table displayed on this slide.

There are many, many responses. The entries on this slide just serve to offer an example of what we would like you to produce.

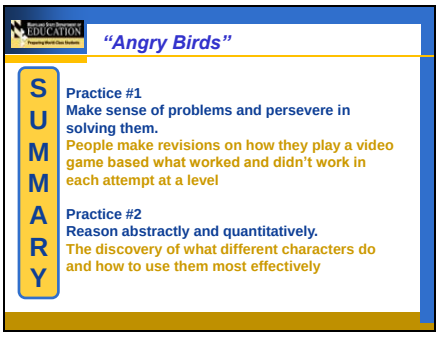
Slide 39

When all of the participants in your group have had an opportunity to complete the reflection sheet, please take time to have each participant share his/her thoughts.

To summarize, participants should share how the design of the learning experiences that they provide for students could parallel the positive aspects of video game design.

Please *PAUSE* the Webinar now for your discussion.

Slide 40



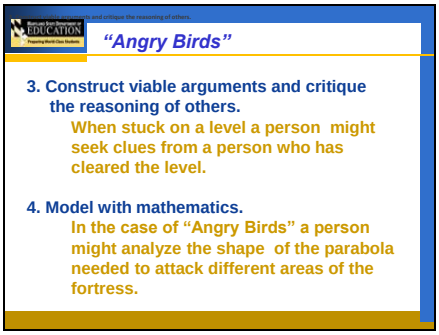
Knowing that some viewers of this Webinar might be alone, we wanted to provide a few sample responses to consider.

This slide offers a few connections for Practices 1 and 2. Please take a minute to look at this slide and the next 3 slides for some of our ideas.

Practice #1
Make sense of problems and persevere in solving them.
People make revisions on how they play a video game based what worked and didn't work in each attempt at a level.

Practice #2
Reason abstractly and quantitatively.
The discovery of what different characters do and how to use them most effectively.

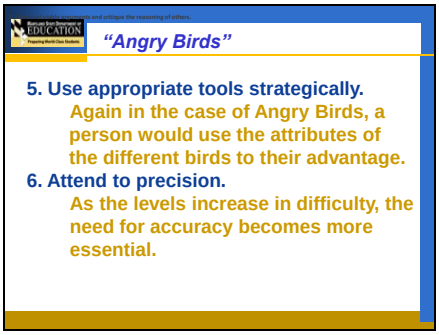
Slide 41



Practice # 3
Construct viable arguments and critique the reasoning of others.
When stuck on a level a person might seek clues from a person who has cleared the level.

Practice #4
Model with Mathematics.
In the case of "Angry Birds" a person might analyze the shape of the parabola needed to attack different areas of the fortress.

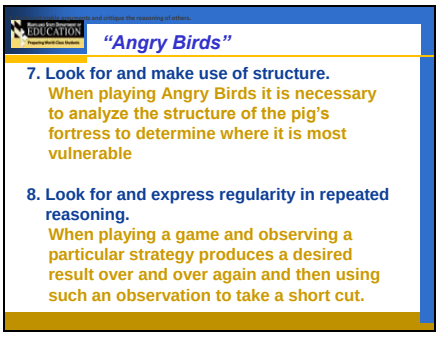
Slide 42



Practice #5
Use appropriate tools strategically.
Again in the case of Angry Birds, a person would use the attributes of the different birds to their advantage.

Practice #6
Attend to precision.
As the levels increase in difficulty, the need for accuracy becomes more essential.

Slide 43



Practice #7
Look for and make use of structure.
When playing Angry Birds it is necessary to analyze the structure of the pig's fortress to determine where it is most vulnerable.

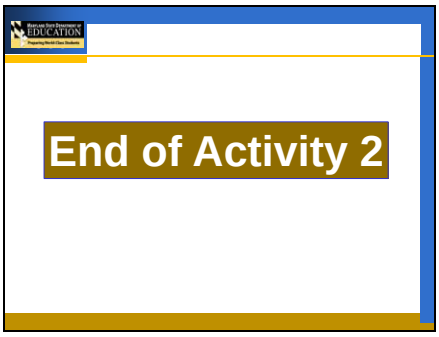
Practice #8
Look for and express regularity in repeated reasoning.
When playing a game and observing a particular strategy produces a desired result over and over again and then using such an observation to take a short cut.

Slide 44

People, who play video games for an extended length of time, certainly persevere. They try the game over and over again each time taking lessons from what they learned when they failed to conquer a level. As can be seen from *Angry Birds*, we can grow in our mathematical thinking and problem-solving ability through real-life experiences and EVEN games.

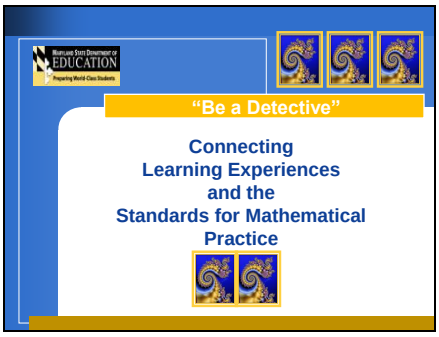
Often, the game structure provides an environment of support that leads to confidence and new knowledge. In fact, it is that type of environment in which the Standards for Mathematical Practice are valuable tools that when implemented promote success.

Slide 45



This is the end of the Activity 2. If you are watching this Webinar in sections, this is a good place to stop the.

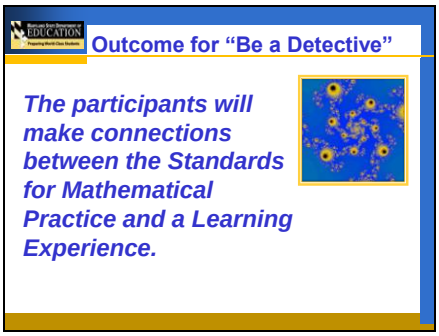
Slide 46



This is the final activity of the Webinar. It is entitled "Be a Detective".

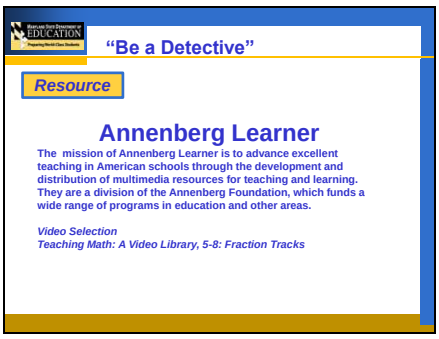
In this activity you will watch a video from the Annenberg Foundation in order to make connections between the Standards for Mathematical Practice and an actual classroom learning experience.

Slide 47



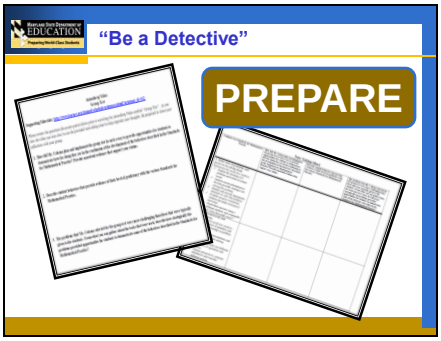
We entitled this activity "Be A Detective" because we think of the person completing this activity as a detective looking for evidence of how the proficiencies described in the Standards for Mathematical Practice are being nurtured in an actual classroom learning experience.

Slide 48



As we have been going out around the state we've been hearing from countless educators that what they really needed to see was examples of teachers teaching lessons where the Standards for Mathematical Practice were being nurtured. The clip that we selected from the Annenberg Learner video library was not created for this purpose, but we thought it did provide a lesson that would lend itself to this type of analysis.

Slide 49



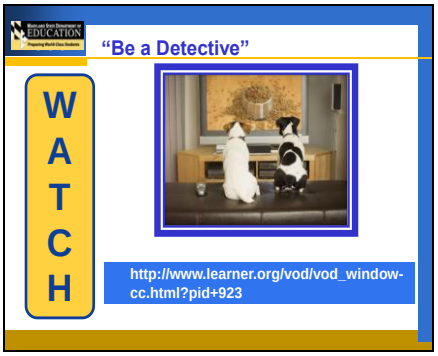
Before beginning this activity, please review the discussion points found on this Annenberg video "Group Test" document that we mentioned back at the beginning of this Webinar. There is also a Note Taking Sheet which provides a summary for each practice. You can choose to use the Note Taking Sheet instead of the sheet that has the 3 questions. Whatever works for you.

If you are watching this part of a larger Professional Development session you might

choose to divide up the tasks. You might assign one or two practices to each person or pair. Have that pair look for a particular set of practices to analyze. Or you might choose to get one group to analyze what the teacher is doing, another group to analyze what the student is doing and another group to analyze the task itself.

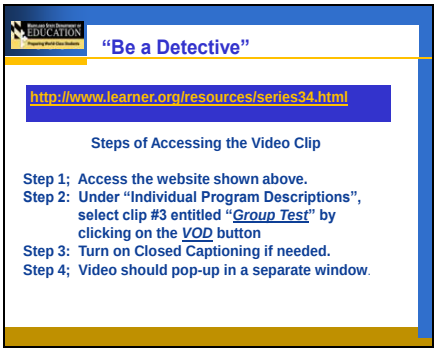
Those are just some ways that we could facilitate this particular activity.

Slide 50



At this time you should access the website that is listed on the accompanying slide so that you can watch the video that we have selected for you.

Slide 51



If you have any difficulties in finding this video clip you can:

- Go to the website displayed on the slide.

There are a list of videos that you can access. We are using #3.

Step 1: access the website:

http://www.learner.org/resources/series34.html

Step 2: Under individual program descriptions, select clip #3 entitled, "Group Test" by clicking on the VOD button on the right.

There is a closed captioning option that you can turn on.

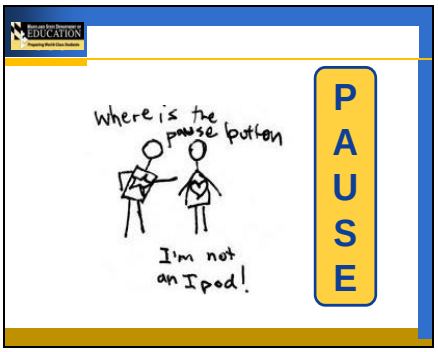
Step 3: Turn on closed captioning if needed (If you need closed captioning, please click on the white box that is labeled CC located under

the TV screen on the video)

The video will pop up in a separate window. It's not very large, so this is something that people may need to do on individual computers.

I don't know how well it will work in a large group setting.

Slide 52



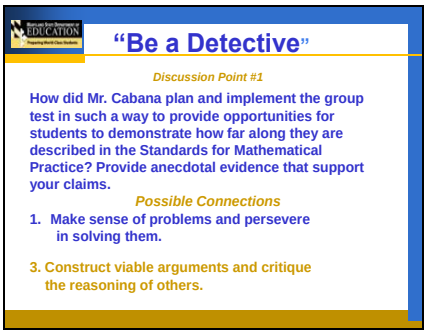
So at this point, hopefully everyone has found the video and that you will PAUSE the Webinar and take time to go and watch the video.

Slide 53

Welcome back!!!

We hope that you found the video clip interesting. At this point we would like for you to demonstrate that you were a good detective by sharing the evidence that you collected with your co-workers. Please PAUSE here and share your discussion points with your co-workers.

Slide 54



As with the Angry Birds activity we wanted to provide a few sample answers for viewers of this Webinar who might be completing this activity alone.

For Discussion Point#1:

We are looking at Mr. Cabana's plan and the whole aspect of the group test. We thought that this particular activity and the way he structured it lent itself to Practice #1.

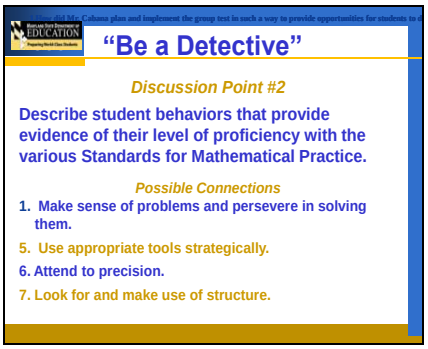
Practice #1
We felt that using the group quiz and having the group quiz contain non-traditional challenging

problems made it necessary for the students to show their proficiency with Practice #1 in that they had to make sense of the problem and they had to look for an entry point.

Practice #3
Another connection we observed was that by constructing the activity in the way that he did Mr. Cabana set the stage for making students have to listen to each other in order to come up with answers that they could all agree upon. Practice #3 was very evident. They were constructing viable arguments but at the same time they were listening to others and accepting and critiquing the reasoning of others.

We are sure that there are many other connections that could be made and hopefully these are just a few to think about and we hope you had some great conversations that include a discussion of other possibilities

Slide 55



Discussion Point #2

This was about what the students were doing and what were they doing that showed proficiency with the various Standards of Mathematical Practice.

Two things we observed were the connection for:

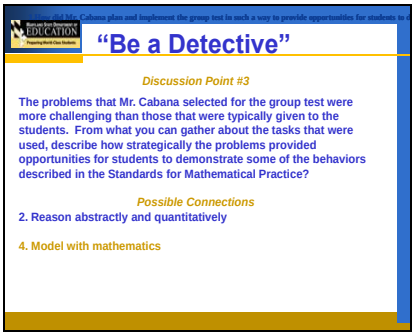
We thought that there was a connection for Practice #7.

- There was a student who talked about with the very first problem where they were given the list of numbers letting the first number in the sequence have an exponent of 1 and the number itself was the y-coordinate. Therefore, they created a graph on the coordinate grid and that gave them a way to analyze the problem.

Another connection we observed was the appropriate use of calculators, which lent itself to Practice #5. The Students did a great job of analyzing the problem and investigating not just using the calculator to get answers but to actually investigate the problem.

We hope that you found many other connections we just wanted to list a few here.

Slide 56



The final discussion point was about that task itself.

Discussion Point #3 had to do with the problems.

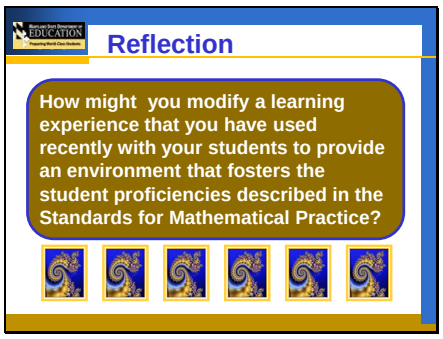
If you want to see more details about the problems, on the Annenberg website there is a button that talks about support materials where you can see these problems in greater detail and actually see some answers you can use.

What we observed is connection to practice #2 in that the students really needed to look at the problem using the numeric, the graphic, the verbal and the symbolic representations to really do a good job with this problem. We thought that they did a nice job of reasoning abstractly and quantitatively.

We also thought that there was a connection to the Modeling of Mathematical Standards. In the one problem they had to decide whether a particular situation would be better modeled by a linear or an exponential model.

Once again, we want to emphasize that there are many other connections that could be made and hopefully you all had some rich conversations that include a discussion of other possibilities.

Slide 57

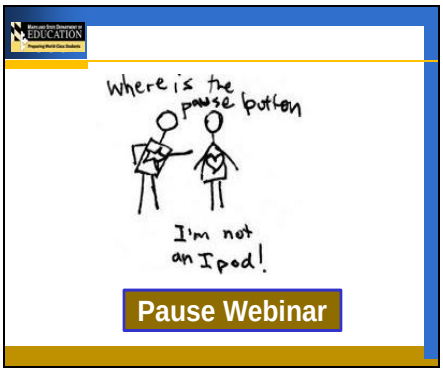


Reflection:

We hope that the actions of the teacher, the students and the context of the instructional task that you observed while watching this video have given you things to think about. To summarize this activity, we would now like for you to take a few minutes to reflect on your own teaching practices. Using a lesson you have taught recently, identify ways you **could** modify this lesson that would help students to continuously develop proficiencies with the Standards for Mathematical Practice.

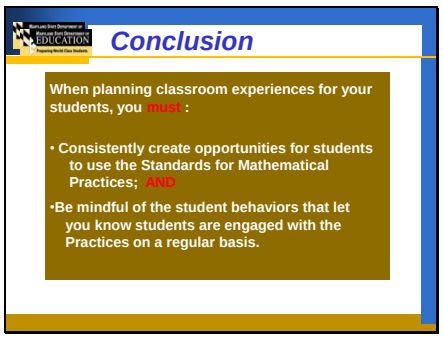
Think about how, At the end of the modified classroom experience, you would know… that the students had depended on or used the practices? What evidence would you want to gather as proof? What student behaviors would you expect to see that would allow you to declare your lesson a success with the practices? After reflecting for a while, share with someone sitting next to you. Or jot down your thoughts on paper.

Slide 58



Once again, *PAUSE* the video to give yourself time to complete this activity and to share the learning experience with your co-workers.

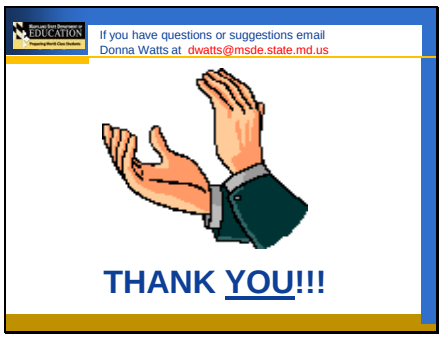
Slide 59



Conclusion:

As we have seen from the video, the classroom learning experiences we create must be a conscious effort to make sure students have daily opportunities to grapple, persevere, critique their own work and that of peers, justify their reasoning, synthesize new information, come to conclusions, model, apply abstract thinking to specific scenarios, and the various other proficiencies discussed in the eight Standards for Mathematical Practice.

Slide 60



Thank you for joining the MSDE Mathematics Team in this first follow-up Webinar for Mathematics. Please know how much we value the work you do with students and your colleagues to include in instruction in Mathematics in Maryland. We hope that this Webinar not only refreshed your memory from this past summer's Educator Effectiveness Academy but also added to your knowledge of the Common Core State Standards.

So what happens next?

A Spring follow-up Webinar is in the works and will be available April 2012. We will keep you posted.

In addition, the "Women of Mathematics" are busily planning and preparing for the second round of Maryland Educator Effectiveness Academies to be conducted throughout the state the summer 2012.

If you have any suggestions to improve this Webinar or the summer academy experience, or would like suggest an activity that we might want to consider. Please email me at the address at the top of the slide.

Today's Webinar is now finished. Those of us in

the office of Mathematics again would like to thank you for your dedication to the teaching and learning of Mathematics in Maryland.